REMARKS

The Office Action dated December 11, 2008 has been received and noted. Claims 22-23, 25 and 32-33 have been canceled. Claims 1-4, 8-11, 15-18, 24 and 26-28 have been amended. New claims 34-38 have been added. The above claim amendments and following remarks are being submitted as a full and complete response to the Office Action. Authorization is granted to charge counsel's Deposit Account No. 01-2300, referencing Attorney Docket No. 030687-00586, for any additional fees necessary for entry of this Response.

Reconsideration of this application is respectfully requested in view of the above claim amendments and following remarks.

Rejections under 35 U.S.C. § 112

In the Office Action, independent claims 1, 8, 15 and 24 and dependent claims 2-7, 9, 11-14, 16, 18-21, 25 and 27-31 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Although the Applicants believe that the subject claims are not indefinite and satisfy the written description requirement for the reasons set forth in the Amendment dated September 30, 2008, the subject claims have been amended as suggested by the Examiner to expedite prosecution of this application. In particular, the claims have been amended to recite "a two-dimensional (2D) array of detectors." The Applicants respectfully request withdrawal of the Section 112 rejections. Reconsideration is requested.

Rejections under 35 U.S.C. § 103

In the Office Action, all pending claims 1-21 and 24-31 were rejected under 35 U.S.C. §
103(a) as being unpatentable over Nishikado (US Patent No. 5,995,883) in view of Sano et al.
(US Patent No. 6,657,705) and further in view of Dunn (PCT Publication WO91/13319). The
rejections are respectfully traversed and reconsideration is requested.

It is noted that independent claims 1, 8 15 and 24 have been amended to clarify the
subject matter for which protection is being sought. Support for the amendments to claims 1, 8
15 and 24 may be found in the originally filed specification, for example, in paragraphs 18, 21
and 29-31 and Figures 1 and 6A-6D. It is submitted that none of the references, either alone or
in alleged combination, discloses or suggests the robots or the methods for controlling a robot, as
claimed.

For example, amended independent claim 1 recites a robot comprising:
a motion unit;
a two-dimensional (2D) array of detectors supported by the motion unit, each
detector having a counter associated therewith, the 2D array operable to generate
a frame of distance indications to one or more features in an environment in
which the robot operates;
an infrared sensor including: (a) an infrared light source configured to produce a
plurality of pulses of infrared light directed toward the environment of the robot;
and (b) at least one optic element configured to focus a plurality of reflections of
the infrared light pulses from the environment of the robot to the 2D array of
detectors, causing the detection of the 2D array of detectors; and
at least one processor operatively coupled to the 2D array of detectors, the
processor operable: (a) to determine one or more features of the environment
based at least in part on one or more frames of distance indications: and (b) to
control the motion unit of the robot to avoid the one or more detected features.

The Applicants respectfully submit that amended claim 1 is patentable over
Nishikado, Sano and Dunn, taken alone or in alleged combination, at least because these

references fail to disclose or even suggest "a two-dimensional (2D) array of detectors supported by the motion unit, each detector having a counter associated therewith, the 2D array operable to generate a frame of distance indications to one or more features in an environment in which the robot operates" and "at least one processor … operable … to determine one or more features of the environment based at least in part on one or more frames of distance indications," as recited in amended claim 1 of the application.

More specifically, Nishikado discloses an autonomous vehicle that has a distance measuring sensor that periodically measures the distance to objects surrounding the vehicle and controls movement of the vehicle as to avoid these objects (Abstract). The sensor detects infrared signals reflected from the objects, determines intensity of the received signals and measures distance to the object based on the signal intensity (col. 3, line 10; col. 4, ll. 13-22 and 36-53). However, Nishikado fails to disclose or even suggest that the sensor includes a 2D array of detectors much less that such 2D array of detectors is operable to generate "a frame of distance indications to one or more features in an environment," as recited in amended claim 1.

Sano discloses a distance measuring apparatus that includes a scanning mechanism 35 that emits a laser pulse beam and a 2D array of detectors 43 that detect reflections of the laser pulse beam from various objects in the surrounding environment (col. 7, line 55 to col. 8, line 5). The detected signal from each detector in the 2D array is transmitted to a time measuring circuit 61 that detects phase difference between the original and reflected signal to determine time difference between two signals (col. 11, ll. 20-45). A processor 33 then uses this time difference information to determine distance to the object for the given detector cell (col. 11, ll. 46-56). Notably, in Sano, there is only one time measuring circuit 61 and signal from each detector cell

in the 2D array 43 that is processed separately by this circuit (col. 13, ll. 59-61). In contrast, claim 1 of the present application recites that each detector in the 2D array has "a counter associated therewith." This enables the 2D array to generate "a frame of distance indications to one or more features in an environment," and that a processor is operable "to determine one or more features of the environment based at least in part on one or more frames of distance indications." Sano does not disclose or even suggest that the 2D array of detectors 43 can generate "a frame of distance indications" or that processor 33 can process such "a frame of distance indications."

Lastly, Dunn discloses a distance measuring apparatus that operates by transmitting an infrared signal, detecting signal reflected from the objects in the surrounding environment and determining distance to the object by comparing the timing of the transmitted and received signals (page 7, line 26 to page 9, line 7). However, Dunn does not disclose or even suggest that the apparatus includes a 2D array of detectors, each having a counter, and operable to generate "a frame of distance indications to one or more features in an environment," as recited in claim 1.

Therefore, amended independent claim 1 is patentable over Nishikado, Sano and Dunn, taken alone or in alleged combination, and its rejection should be withdrawn.

Moreover, it is submitted that the rejected dependent claims 2-7 and new dependent claims 34-36 are patentable over the cited prior art at least because of their dependency on independent claim 1 and for the additional features that they recite.

Independent claims 8 and 15 are patentable over Nishikado, Sano and Dunn at least because these references do not disclose or even suggest a method for controlling a robot or a robot comprising, in part, a 2D array of detectors "operable to generate a frame of distance

indications to one or more features of the environment" or a processor "operable to determine one or more features of the environment based at least in part on one or more frames of distance indications," as recited in amended claims 8 and 15.

The rejected dependent claims 9-14 and 16-21 and new dependent claims 37-38 depend on claims 8 and 15, respectively, and are patentable over cited prior art at least because of their dependency on claims 8 and 15 and for the additional features that they recite.

Independent claim 24 is patentable over Nishikado, Sano and Dunn at least because these references do not disclose or even suggest a method for controlling a robot comprising, *inter alia*, "retrieving from a memory device of the robot one or more two-dimensional (2D) frames of distance indications to one or more features of an environment in which the robot operates; processing the one or more retrieved 2D frames of distance indications to determine one or more features of the environment; [and] adding the one or more determined features to an internal map of the environment," as recited in amended claim 24.

The rejected claims 26-31 depend on claim 24 and are patentable over the cited prior art at least because of their dependency on claim 24 and for the additional features that they recite.

Conclusion

For all of the above reasons, it is respectfully submitted that pending claims 1-21 and 24-31 and newly added claims 34-38 are in condition for allowance and a Notice of Allowability is earnestly solicited.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact the Applicants' undersigned

counsel at the telephone number, indicated below, to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,

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Enclosures: Petition for Extension of Time (3 months)